

**A NEW SPECIES OF *POLYRHACHIS (AULACOMYRMA)* EMERY  
(HYMENOPTERA: FORMICIDAE: FORMICINAE)  
FROM PAPUA NEW GUINEA**

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**Abstract**

*Polyrhachis (Aulacomyrma) enigma* sp. n. is described and illustrated from Mt Missim, Papua New Guinea.

**Introduction**

Ants of the subgenus *Aulacomyrma* Emery of *Polyrhachis* Fr. Smith are largely restricted to New Guinea, with species occurring from the eastern Indonesian islands of Aru and Misool, across mainland New Guinea, to the Bismarck Archipelago, including New Britain and New Ireland. A recent revision of the subgenus (Kohout, in press) recognised 36 species. Subsequently, another species was discovered, represented by a single worker and three dealate queens from Papua New Guinea. The worker superficially resembles a member of the subgenus *Cyrtomyrma* Forel (where I had originally placed it), but characters of the queens indicate that it is best placed within *Aulacomyrma*. This remarkable new species is described below.

**Methods**

Photographs were taken using a ProgRes 3012 scanning digital camera (Jenoptik) attached to a Leica MZ16 stereomicroscope. Images were then processed using Auto-Montage (Syncroscopy, Division of Synoptics Ltd, USA) and Photoshop (Adobe Inc., USA) software. Standard Measurements and Indices: TL = Total length (the necessarily composite measurement of the outstretched length of the entire ant measured in profile); HL = Head length (the maximum measurable length of the head in perfect full face view, measured from the anteriormost point of the clypeal border or teeth, to the posteriormost point of the occipital margin); HW = Head width (width of the head in perfect full face view, measured immediately in front of the eyes); CI = Cephalic index ( $HW \times 100/HL$ ); SL = Scape length (excluding the condyle); SI = Scape index ( $SL \times 100/HW$ ); PW = Pronotal width (greatest width of the pronotal dorsum); MTL = Metathoracic tibial length (maximum measurable length of the tibia of the hind leg). Measurements were taken using a Zeiss SR stereomicroscope with an eyepiece graticule calibrated against a stage micrometer. All measurements are expressed in millimetres.

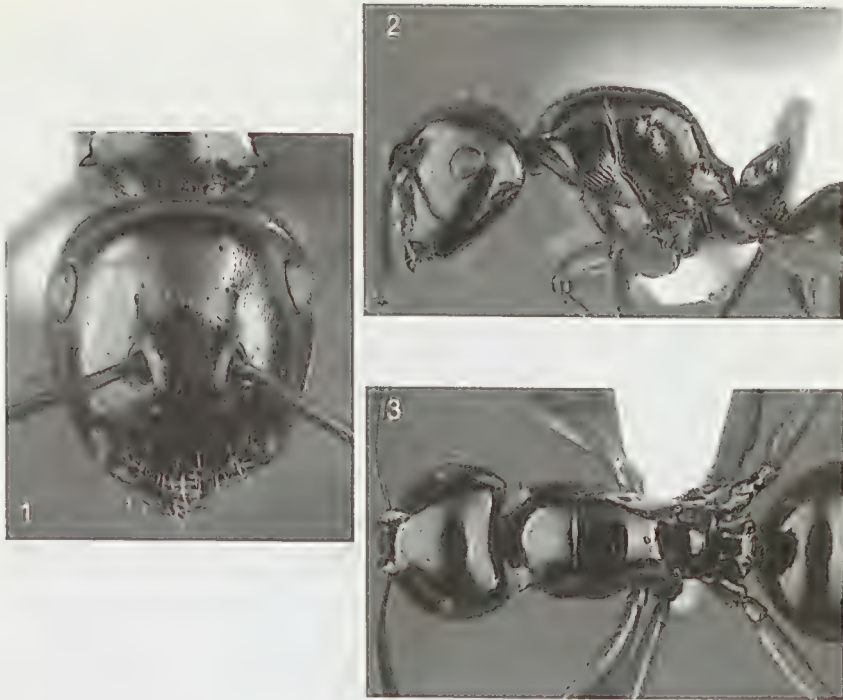
Abbreviations of institutions (with names of curators) are: ANIC = Australian National Insect Collection, Canberra (S.O. Shattuck, R.W. Taylor); BMNH = The Natural History Museum, London (B. Bolton); MCZC = Museum of Comparative Zoology, Harvard University, Cambridge (S.P. Cover); QMBA = Queensland Museum, Brisbane (C. J. Burwell, G.B. Monteith).

***Polyrhachis (Aulacomyrma) enigma* sp. n.**

(Figs 1 - 3)

*Types.* *Holotype* worker, PAPUA NEW GUINEA: Morobe Prov., Mt Misim (Mt. Misim on label), 07°20'S, 146°43'E, (no date of collection), Stevens. *Paratypes*: 3 dealate queens, Eastern Highlands, Mingende, 05°58'S, 144°53'E, 5000 ft, 14.i.1968, B.B. Lowery. Holotype in MCZC; 1 paratype each in ANIC, BMNH and QMBA.

*Description.* Worker. Dimensions: TL c. 6.05; HL 1.56; HW 1.50; CI 96; SL 1.72; SI 115; PW 1.15; MTL 1.93. Black; mandibles reddish-brown with teeth, inner and outer borders and base narrowly lined dark brown. Antennae dark brown with apex of last funicular segment distinctly lighter, yellowish-brown. Mandibles with 5 teeth, reducing in length towards base. Anterior clypeal margin widely and shallowly emarginate medially. Clypeus in profile very weakly sinuate; posteriorly with rather vague, short, blunt, medial carina; basal margin flat, laterally indicated by thin line. Frontal triangle indistinct. Frontal carinae sinuate, rather short, with moderately raised margins anteriorly, rather flat posteriorly; central area relatively wide with weakly raised medial carina. Sides of head in front of eyes weakly concave, converging towards mandibular bases; widely rounded behind eyes into weakly convex occipital margin. Eyes rather small, moderately convex, situated well forward from occipital corners; in full face view marginally exceeding lateral cephalic outline. Ocelli absent. Pronotal humeri with dorsally flattened triangular teeth, their lateral margins continued for a short distance forming incomplete lateral pronotal margins. Mesosoma in profile weakly convex; promesonotal suture distinct; mesonotum with weakly indicated lateral margins, almost flat in profile; metanotal groove lacking; propodeum laterally emarginate, with dorsum smoothly rounding into oblique declivity. Petiole scale-like, with anterior face almost flat, posterior face weakly convex; dorsal margin armed with pair of acute dorsal teeth and pair of more slender, short, lateral spines; margins between dorsal teeth and lateral spines somewhat jagged, with additional pair of blunt denticles. Anterior face of first gastral segment lower than height of petiole, with anterodorsal margin widely rounding onto dorsum of segment. Mandibles at masticatory borders longitudinally rugose, rather polished towards bases. Legs light orange-red with distal ends of femora narrowly and proximal ends of tibiae more widely black; tarsi mostly dark brown with apical segments distinctly lighter, yellowish-brown. Whole body surfaces extremely finely shagreened, with dorsum of head and mesosoma highly polished. Sides of pronotum with numerous shallow striae directed obliquely towards very finely wrinkled lateral lobes; mesonotum and propodeum with numerous, shallow, oblique striae. Abundant shallow punctures scattered over most body surfaces. Mandibles with a few short, curved and semierect hairs near masticatory borders and along outer margins; towards bases with numerous, very short, appressed hairs arising from pits. Clypeus with several short setae lining anterior margin. All body surfaces with numerous, scattered, rather



**Figs 1-3.** *Polyrhachis (Aulacomyrma) enigma* sp. n., worker (1) frontal view of head; (2) lateral view of head, mesosoma and petiole; (3) dorsal view of head, mesosoma and petiole.

short, semierect or appressed hairs arising from shallow punctures and pits. Posterior margins of gastral segments lined with medium length, erect hairs, distinctly longer hairs concentrated around gastral apex. Leading edge of antennal scapes with several short, erect hairs. Legs with only a few, medium length hairs arising from ventral surfaces of femora and dorsal surfaces of middle and hind tibiae.

Queen. Dimensions: TL c. 7.06-7.36; HL 1.75-1.81; HW 1.59-1.68; CI 91-93; SL 1.68-1.84; SI 104-114; PW 1.25-1.31; MTL 1.93-2.03 (3 measured). Black, with colour scheme virtually identical to that in worker. Very similar to worker with usual characters identifying full sexuality, including three ocelli and complete thoracic structure. Clypeus in profile straight, with blunt, longitudinal carina medially; basal clypeal margin flat. Eyes more convex than in worker, clearly breaking lateral cephalic outline. Pronotal humeri with blunt triangular teeth; mesoscutum slightly wider than long with lateral margins strongly converging anteriorly, forming narrowly rounded anterior margin; median line very short, poorly indicated; parapsides distinct, rather

flat; mesoscutum in profile relatively low, widely rounding onto flat dorsum. Mesoscutellum flat, not elevated above dorsal plane of mesosoma; metanotal groove strongly impressed. Propodeum wide, strongly transverse, convex in profile, laterally terminating into blunt angles; dorsum descending into steeply oblique declivity in medially uninterrupted line. Petiole with dorsal margin sharp, entire, laterally weakly rounding into short, acute, posterolaterally curved spines. Subpetiolar process triangular. Anterior face of first gastral segment low, smoothly rounding onto dorsum. Mandibles rather distinctly, longitudinally rugose. Head, including clypeus with very faint, longitudinal striae, more distinct between eyes and frontal carinae. Mesosoma laterally with striae more distinct than those in worker; mesoscutum anteriorly with longitudinal, medially converging, rather weakly indicated striae. Propodeal dorsum distinctly, longitudinally striate with declivity and petiole very finely, mostly transversely, reticulate. All dorsal surfaces of head, mesosoma and gaster very finely shagreened, highly polished, but not as shiny as in worker. Male and immature stages unknown.

*Remarks.* The holotype is the only available worker of this species and nothing is known about its nesting habits. In general appearance, including the scale-like petiole, it closely resembles some members of the subgenus *Cyrtomyrma*. However, the shape of the head that almost completely lacks a lateral carina, and the partially developed lateral margins of the pronotum and mesonotum, exclude it from *Cyrtomyrma*. In particular, the queens closely resemble some members of the recently established *P. porcata*-group of *Aulacomyrma* (Kohout, in press) and their distinguishing characters, including the poorly defined lateral margins of the mesosoma and the arcuate dorsal margin of the petiole with short lateral teeth, support the placement of *P. enigma* within this latter subgenus. In spite of the distance (about 260 km) separating their collection localities, the holotype worker and paratype queens share most of the specific morphological characters and I am confident that they represent a single biological species.

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### Reference

KOHOUT, R.J. (in press). Revision of the subgenus *Aulacomyrma* Emery of the genus *Polyrhachis* Fr. Smith, with descriptions of new species. *Memoirs of the American Entomological Institute* 78.